

P008 Alkaline cyanide biodegradation by *Pseudomonas pseudoalcaligenes* CECT5344
Luque-Almagro VM, Blasco R, Huertas MJ, Martínez-Luque M, Moreno-Vivián C, Castillo F, Roldán MD
Departamento de Bioquímica y Biología Molecular.
Universidad de Córdoba, Spain

Cyanide is produced by bacteria, algae, fungi and plants. However, anthropogenic activities, such as mining and electroplating industry, are the main source of cyanide. The jewellery industry of Córdoba, Spain, produces an alkaline residue containing $20 \text{ g}\cdot\text{l}^{-1}$ of free cyanide and high amounts of cyanide-metals complexes, thus making this effluent poisonous. Cyanide is toxic for organisms because produces stable complexes with metals essential for protein function. Some organisms are able to use it as nitrogen source and bioremediation techniques are an attractive alternative to chemical methods for cyanide removing in industrial effluents. A cyanotrophic microorganism must have a cyanide resistance mechanism, a system for iron uptake, and a cyanide assimilation pathway.

Pseudomonas pseudoalcaligenes CECT5344, a strain isolated from the Guadalquivir river (Córdoba), uses several nitrogen sources including cyanide, cyanate, β -cyanoalanine, cyanacetamide and nitroferricyanide under alkaline conditions, which prevents volatile HCN (pKa 9.2) formation. This bacterium also grows with the heavy metal, cyanide-containing waste water generated by the jewellery industry. CECT5344 is a cyanide-resistant strain which induces an alternative oxidase and a siderophore-based mechanism for iron acquisition in the presence of cyanide. For these reasons, the strain CECT 5344 is a good candidate to be used in cyanide bioremediation.